

Appl. No. 09/943,487
Reply to Office action of November 5, 2003

Amendments to the Claims:

Claims 1-7 (canceled).

Claim 8 (currently amended) A method for processing a surface of a semiconductor wafer comprising the steps of:

- a) removing a material layer overlying a barrier layer from the surface of the semiconductor wafer at a first chemical-mechanical polishing station with a chemical-mechanical polishing pad and using an abrasive slurry; and
- b) removing the barrier layer from the surface of the semiconductor wafer at a buff station using a buff pad and a first barrier layer slurry.

Claim 9 (original) The method of claim 8, further comprising the step of buffing the wafer surface after barrier layer removal.

Claim 10 (previously presented) The method of claim 9, wherein a set of buff station parameters are different for the barrier layer removal step than for the buffing step.

Claim 11 (currently amended) The method of claim 8, wherein a different slurry composition is used for the barrier layer removal step than for the buffing step.

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Claim 12 (original) The method of claim 8, further comprising the step of detecting when the material layer is substantially removed from the wafer.

Claim 13 (original) The method of claim 8, further comprising the step of detecting a point at which barrier layer removal is substantially complete.

Claim 14 (previously presented) The method of Claim 13, wherein the step of detecting a point at which barrier layer removal is substantially complete is accomplished using an endpoint detection system.

Claim 15 (previously presented) The method of claim 14, wherein the endpoint detection system is comprised of an optical detection system.

Claim 16 (previously presented) The method of Claim 14, wherein the endpoint detection system is comprised of an infra red detection system.

Claim 17 (previously presented) The method of Claim 14, wherein the endpoint detection system is comprised of a laser detection system.

Claim 18 (previously presented) The method of Claim 14, wherein the endpoint detection system is comprised of a motor current detection system.

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Claim 19 (original) The method of claim 8 further comprising the step of conditioning the buff station pads.

Claim 20 (original) The method of claim 19 wherein the conditioning step is accomplished by pressing a lower buff pad against an upper buff pad and rotating each pad at a different velocity.

Claim 21 (original) The method of claim 19, wherein the pad conditioning step is performed between each wafer being processed.

Claim 22 (canceled).

Claim 23 (original) The method of claim 8, wherein the material layer is comprised of aluminum, copper, or tungsten.

Claim 24 (original) The method of claim 8, wherein the barrier layer is comprised of Ti, TiN, Ta, or TaN.

Claim 25 (original) The method of claim 8, further comprising the step of:

- c) supplying a first polishing slurry to the primary polishing station; and
- d) supplying one or more different polishing slurries to the buff station.

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Claim 26 (currently amended) The method of claim 8 wherein the step of removing the barrier layer comprises the step of removing the barrier layer using a ~~Politex Supreme~~ buff pad having a volume compressibility of about 20-40 percent.

Claim 27 (previously presented) The method of claim 8 wherein the step of removing the barrier layer comprises the step of removing the barrier layer using a slurry comprising an abrasive suspension.

Claim 28 (previously presented) The method of claim 27 wherein the step of removing the barrier layer comprises the step of removing the barrier layer using a slurry comprising an aqueous acidic or basic solution.

Claim 29 (previously presented) The method of claim 8 further comprising the step of buffing the surface of the semiconductor wafer after the step of removing the barrier layer, the step of buffing the surface of the semiconductor wafer comprising buffing at the buff station using a buff pad and a second barrier layer slurry comprising a diluted first barrier layer slurry.